

[72] Inventors **Julio C. Giacosa**
1399 Drive Estrazulas St.;
Abel Hofman, 1573 Acapulco St., both of
Montevideo, Uruguay

[21] Appl. No. **849,217**

[22] Filed **Aug. 11, 1969**

[45] Patented **July 27, 1971**

[32] Priority **May 7, 1969**

[33] **Uruguay**

[31] **17526**

[56]

References Cited

UNITED STATES PATENTS

514,188	2/1894	Harvey	4/48
1,299,692	4/1919	Donnelly	4/49
1,382,028	6/1921	Sweeny	4/48
2,700,163	1/1955	Sturman	4/49
2,821,720	2/1958	Cornalba	4/48 X
2,828,761	4/1958	Weibert, Jr.	4/48 X
3,505,688	4/1970	Sloan	4/42

Primary Examiner—Henry K. Artis

Attorney—Tashof and Osheroff

[54] **SYSTEM OF OPERATION OF TANKS OR THE LIKE**
6 Claims, 7 Drawing Figs.

[52] U.S. Cl. 4/48,
4/67

[51] Int. Cl. E03d 1/10

[50] Field of Search 4/48, 42,
49, 50, 52, 67, 56, 58

ABSTRACT: A tank having a flexible wall portion and a discharge siphon primable when the level of liquid in the tank exceeds a predetermined level, whereby mechanical pressure on the flexible portion raises the liquid level and primes the siphon to discharge the liquid from the tank.

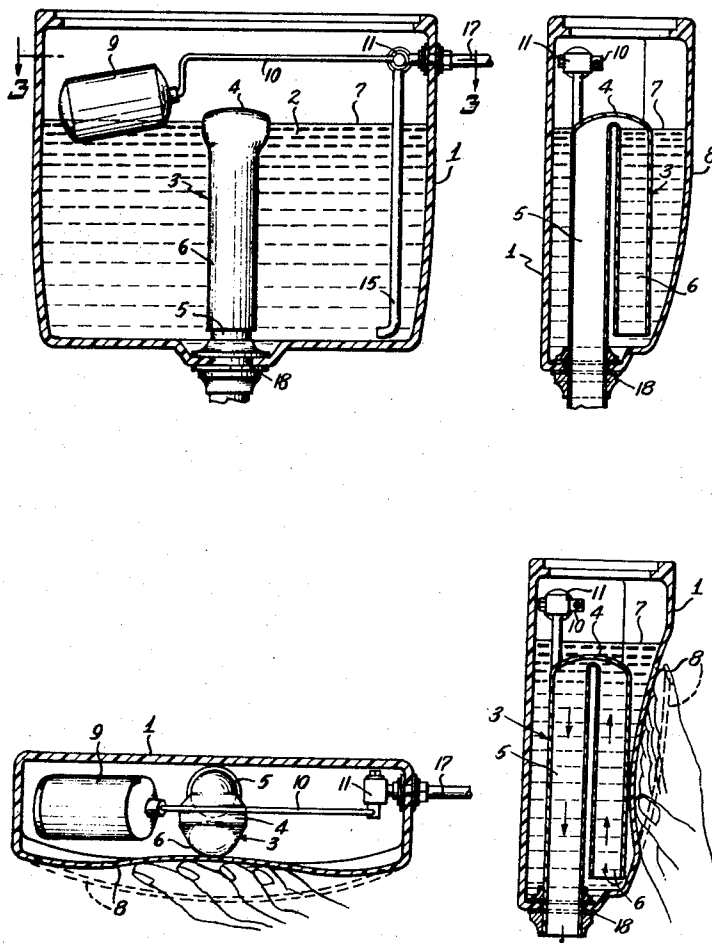


Fig. 1.

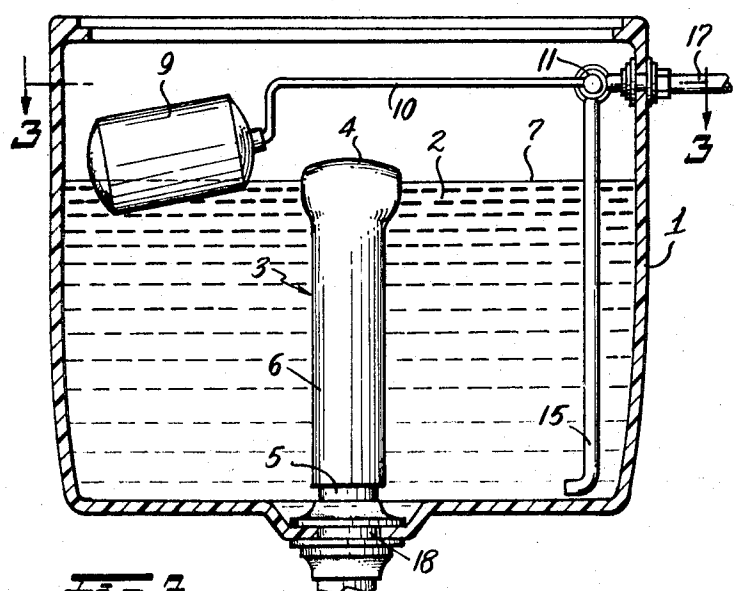


Fig. 2.

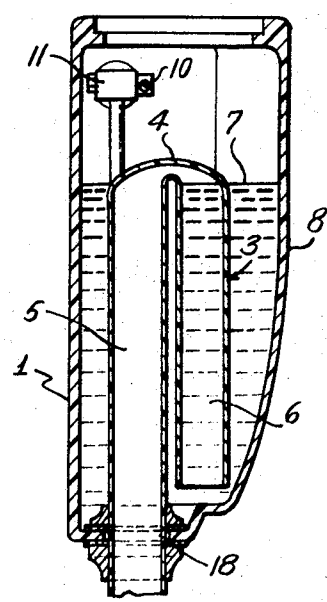


Fig. 3.

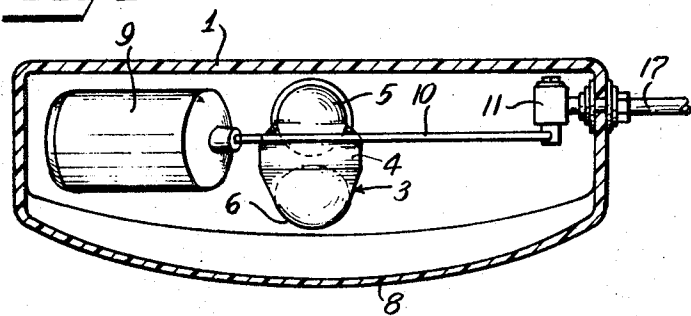


Fig. 4.

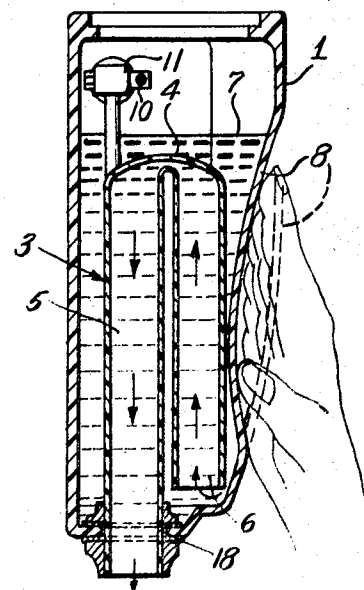


Fig. 5.

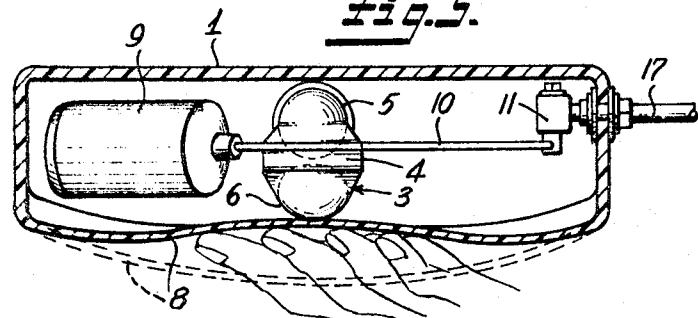


Fig. 6.

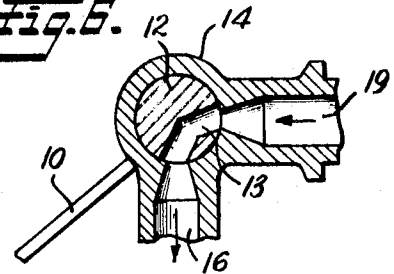
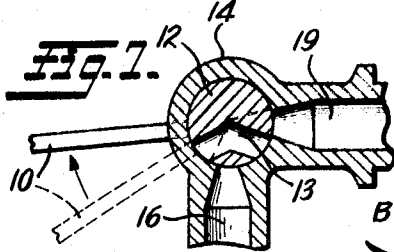


Fig. 7.



INVENTORS
JULIO C. GIACOSA
ABEL HOFMAN
BY *Tashof & Osheroff*
ATTORNEYS

SYSTEM OF OPERATION OF TANKS OR THE LIKE

The present invention relates to a new system of operation applied to tanks or the like, more particularly to a new system which allows the discharge of the liquid contained in such tanks, preferably those which are related to plumbing and by extension, to any other tank to which a system of discharge is to be applied, without utilizing any mechanism for it, except the one which is related to the admission of the liquid in the container, which in its turn, according to the invention, lacking the valvular system, has been simplified, so that its wear and tear is absolutely eliminated and consequently its lack of adjustment.

As for the subject in general, mainly which is related to the tanks in plumbing, there are a considerable number of devices of discharge of the liquid contained in them, among which it is possible to indicate the one that includes a rubber ball, which plugs or clears the duct of discharge by command from the outside of the container, which command is connected with a mechanism of complicated construction. While this system fulfills the function to which it is intended, it is not possible to eliminate the misadjustment of its component parts, since its continual use contributes to the wear and tear of its pivoting movements, which operate partly within the liquid and partly outside of it, which provokes the corrosion of the same when being saturated with dampness, producing false movements and consequently trouble. On the other hand, the said ball, when plugging the duct of discharge, must be juxtaposed absolutely on the mouth of the duct. The particles contained in the liquid, in this case water, are adhered on its surface, so that with the time the tightness of the required plugging is not taking place correctly.

Another known system provokes the discharge by providing, within the container, a siphon which at its base shows a plurality of holes plugged by a circular truncated conical piece, which is moved by a mechanical command, permitting the inflow of the liquid through such holes, provoking, in this way, the priming of the said siphon and consequently the discharge of the liquid. While this device is ingenious, it also includes mechanical elements which are subject to misadjustment for their wear and tear.

Another system provokes the priming of the siphon constructed of flexible material, arranged in the liquid by oscillation provoked by a mechanical command. As the one described above, the mechanical parts and the continual oscillation of the siphon which logically reproduce folds in its structure, provoke wear and tear in a short time and consequently it is necessary to replace such element periodically.

It is very possible that there are other systems, unknown by the applicants, but it can be assured that all of them required mechanisms subject to misadjustments which provoke an abnormal operation of the fixture at a given moment.

The invention entirely eliminates all types of mechanisms which may provoke the discharge of the liquid, both related to tanks applied in plumbing or for any other use. As a matter of fact, the reservoir or container, according to the invention, is made of flexible plastic material, which in this case has a great importance, because its elasticity allows the discharge of the liquid by itself, when priming the siphon interiorly arranged there, which can be made of any suitable material, but preferably for constructive purposes, which includes the putting into practice of this invention, also of plastic material. Such elasticity allows, when any of the walls forming the container are pressed by normal means, the displacement of the level of the liquid contained in it, by rising, in this way overflowing the empty space shown by the internal curve which joins the ducts, forming the siphon. This action provokes the priming of such siphon and consequently its immediate reaction discharging the totality of the liquid contained in the tank. As it can be easily noted, the tank itself serves as a command for the siphon to operate. The flexible plastic material, constituting the tank, for its elasticity allows the pressure on any

of the walls of which it is constructed and the pressed part returns to its original position immediately upon ceasing such pressure.

In the functional and constructive order and with the purpose of covering the distance between the stable level and its displacement to overflow the said curve of the siphon, it has been shaped so that it shows an enlargement suitably calculated, so that the volume of absorption and discharge of the liquid circulates entirely in its interior. This enlargement allows the reduction, in a high degree, of the distance which is to be covered between the stable or normal level and the displaced one, in direct proportion with the effort which must be imparted when pressing on any of the walls of the container. Independently from the description, but connected with the system, the admission of the liquid in the container is operated, according to the invention, eliminating any complicated valvular device. Admission of liquid into the reservoir is controlled by a valve actuated by a float, said valve comprising a circular core rotating in a valve casing, said core having a bent bore or perforation, the position of the bore relative to said casing determining whether the valve permits or prevents entrance of liquid into the reservoir. The core is operated by the float. This device, which on the other hand, is utilized to regulate the passage of the gas or steam, has never been applied in tanks, though it eliminates a complicated valvular system. For this case it has been provided that this valve should be carried out also of plastic material, which assures, by a perfect adjustment, a long time of functioning, as this material is rustproof.

For better understanding the invention and for its putting into practice with all facility, drawings are enclosed, in which:

FIG. 1 represents, in longitudinal section and in a nonlimitative example, the tank applied to plumbing, of the invention, in inoperative position;

FIG. 2 is a cross-sectional view of the same, also in inoperative position;

FIG. 3 is another plan view, from which the cover has been withdrawn, showing the location of the front wall of the structure of the tank, when it is not pressed, and the shape given to the upper part of the curve of the siphon;

FIG. 4 is a cross-sectional view corresponding to FIG. 2 showing the position taken by the front wall when it is pressed, provoking the rising of the level of the liquid;

FIG. 5 is a plan view corresponding to FIG. 3 showing the device when the said wall is pressed;

FIG. 6 represents, in section, the regulatory valve 4 the admission of the liquid in the container;

FIG. 7 is the same valve stopping the flow of liquid according to the position adopted by the arm of the float.

Referring to the accompanying drawings, the tank of the invention is constituted by a reservoir or container 1 which, in the illustrated embodiment, is made of flexible elastic plastic material, said reservoir containing liquid 2 having a predetermined normal level 7. In the reservoir 1 there is a discharge siphon 3 composed of descending duct 5 whose lower end communicates with discharge outlet 18 and ascending duct 6 whose lower end is in communication with the interior of said reservoir, the other or upper ends of both ducts being interconnected by bend 4. In the illustrated embodiment said siphon is made of rigid plastic material. Bend 4 is flattened and laterally widened so as to provide a flow capacity equal to that of ducts 5 and 6 to permit rapid emptying of the reservoir while at the same time lowering the height of the bend. The normal level 7 of the liquid is below the bend 4 so that the siphon is not actuated and no liquid will flow from the reservoir through the siphon.

In order to discharge the contents of the reservoir a wall of the reservoir, such as front wall 8, is pressed by manual pressure. This pressure raises the level of the liquid in the reservoir to overflow the interior of the bend, causing the liquid to flow through the bend, thereby priming and actuating the siphon 3. As soon as siphon 3 is primed the liquid flows from the reservoir up the ascending duct 6 through the bend 4 down through

descending duct 5 and out through the outlet 18, thereby discharging substantially all of the liquid in the reservoir. As soon as manual pressure is removed from wall 8, because of the elastic nature of the wall, it returns to its original position so that when more liquid is introduced into the reservoir the operation can be repeated.

Introduction of the liquid into the reservoir is controlled by float 9 connected by means of valve arm 10 to a valve 11, which, in the illustrated embodiment, is made of plastic material. Valve 11 is constituted by a cylindrical core connected to and actuated by arm 10, said core rotating in the cylindrical interior of valve casing 14. Valve casing 14 has an inlet bore 19 and an outlet bore 16 communicating with the interior thereof, inlet bore 15 being connected to a liquid supply conduit 17 and outlet bore 16 being connected to a feed conduit 15 terminating under the level of the mouth or opening of ascending duct 6 of siphon 3, so that the liquid entering the reservoir does not produce any noise. When the float 9 is in the normal or valve closing position, as shown in FIG. 1, the valve core 12 is in the position shown in FIG. 7 with its bore 13 not providing communication between bores 19 and 16 of the valve, thereby preventing admission of further liquid into the reservoir. When the liquid in the reservoir has been discharged the float is lowered so that the arm 10 and the valve core 12 are in the position shown in FIG. 6 with bore 13 providing communication between inlet bore 19 and outlet bore 16, so that the liquid will flow from liquid supply conduit 17 through feed conduit 15 into the reservoir. The flow of the liquid into the reservoir continues until the level of the liquid in the reservoir raises the float to the valve closing position, as shown in FIG. 7, thereby cutting off the intake of liquid.

It is apparent, since the siphon 3 is always open, that the siphon serves as an overflow device for the liquid in the reservoir.

Having determined in this way the nature of the present invention, the statements in the following clauses are declared of exclusive property and right.

We claim:

1. A tank comprising a reservoir for containing liquid, a siphon in said reservoir, said siphon having an ascending duct

communicating with the interior of the reservoir and a descending duct communicating with a discharge outlet in the reservoir, said ducts being interconnected by a bend, said bend extending above the normal level of the liquid in the reservoir so that said siphon is not normally primed, said reservoir being constructed of material such that at least a wall portion thereof is flexible and elastic so that when pressure is applied to said flexible portion the level of the liquid in the reservoir is raised above the interior of said bend thereby priming and actuating the siphon to cause discharge of liquid in said reservoir through said siphon.

2. A tank according to claim 1, wherein said bend is flattened and laterally widened to provide a flow capacity equal to that of said ducts to permit rapid emptying of said reservoir.

3. A tank according to claim 1, wherein said reservoir is made of plastic material.

4. A tank according to claim 1 wherein said siphon functions as an overflow device.

5. A tank according to claim 1, including means for admitting liquid into said reservoir, said means comprising a valve constituted by a casing having a cylindrical interior and an inlet bore and an outlet bore in communication with said casing interior, a cylindrical core rotatably mounted in said casing interior, said core having a bore providing communication between the bores of said casing when said valve is open and for preventing communication between the bores and said casing when the valve is closed, a float and a valve arm having one end connected to said core for moving same between the open and closed positions and the other end connected to said float, the height of said float being controlled by the level of the liquid in said reservoir so that when said liquid is at said normal level said float moves said arm and valve core to the closed position, said inlet bore being connectable to a liquid supply and said outlet bore communicating with the interior of said reservoir.

6. A tank according to claim 5, including a feed conduit in said reservoir, one end of said conduit being in communication with said outlet bore of said valve casing and the other end terminating below the level of the bottom of said ascending duct so that liquid entering said reservoir does not produce noise.

45

50

55

60

65

70

75